



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,394	10/31/2003	Henriette Draborg	10308.200-US	6155
25908 7590 08/10/2009 NOVOZYMES NORTH AMERICA, INC. 500 FIFTH AVENUE SUITE 1600 NEW YORK, NY 10110				
EXAMINER				
MOORE, WILLIAM W				
ART UNIT		PAPER NUMBER		
1656				
NOTIFICATION DATE		DELIVERY MODE		
08/10/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Patents-US-NY@novozymes.com

Office Action Summary

Application No.

10/699,394

Applicant(s)

DRABORG ET AL.

Examiner

WILLIAM W. MOORE

Art Unit

1656

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 57-74 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 57-74 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/US)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Applicant's amendments to the specification and claims filed 19 May 2009 have been entered, correcting continuity data stated at lines 4-8 of page 1 of the specification, cancelling claims 16, 18-47, and 49-56, and adding new claims 57-74. The claim amendments introduce no new matter. The claim objection of record, and rejections of record under 35 U.S.C. §§ 102 and 103, stated in the communication mailed 22 January 2009 are WITHDRAWN in view of the claim cancellations. The new claims 57-74 remain in the application as claims 1-15, 17, and 48 had previously been canceled. In the rejections below, the previously adopted convention of stating the amino acid positions of Applicant's reference group I-S1 subtilase, the subtilisin BPN' amino acid sequence set forth in SEQ ID NO:1 herein, while stating the corresponding positions in the amino acid sequences of Applicant's preferred group I-S2 subtilase, the subtilisin 309 amino acid sequence set forth in SEQ ID NO:2 herein, in parentheses in brackets is maintained.

Election/Restrictions

In response to a telephonic requirement for restriction made in a telephone conversation on 16 September 2005, Applicant had elected, **with** traverse, a modified protease of Group I, which comprised the original claims 1-9, wherein a species elected comprises a substitution at the subtilisin BPN'-correspondent position 62. The election is commemorated at page 3 of the communication mailed 29 September 2005. The non-elected Group II, which comprised the original claims 10-15, was drawn to polynucleotides encoding modified proteases, to vectors and host cells comprising such polynucleotides, and to methods of using a host cell to make an encoded, modified, protease. See page 2 of the communication mailed 29 September 2005.

Applicant canceled claims 10-15 and presented no claims drawn to an invention of the non-elected Group II in the Response filed 29 March 2006. Applicant presented no argument that traversed the requirement for restriction in the Response filed 29 March 2006 and instead "confirm(ed)" the "election (of Group I)" at page 17 of the Response. Applicant presented no claims to the subject matter of the non-elected Group II in Responses filed 5 December 2006, 27 December 2007 and 13 October 2008, demonstrating acknowledgement of the confirmation of the election of Group I. Because Applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 70-74 presented in the Response filed 19 May 2009 are therefore withdrawn from consideration as drawn to a non-elected invention and the

restriction requirement set forth in the communication mailed 29 September 2005 is still deemed proper and is therefore made FINAL.

Double Patenting: Non-Statutory

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 57-60 and 65-69 herein are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over the claims 17, 19-22, and 24-29 of the copending Application No. 11/482,424, in view of von der Osten et al., **US 6,300,116**, Ghosh et al., **US 6,376,450**, Poulouse et al., **US 6,482,628**, and Rubingh et al., **US 6,569,663**, either of Brode et al., **US 6,599,730** or **US 6,436,690**, and Roggen et al., **US 2005/0181446**, all of record. Although the conflicting claims are not identical, they are not patentably distinct from each other because (a) claims 57-60 and 65-69 herein are drawn to group I-S1 and group I-S2 subtilase variants, the latter including subtilisin 309 variants, that comprise the amino acid substitutions **S9R+A15T+V68A** and may comprise one or more of the other amino acid substitutions disclosed at, e.g., pages 2-4 of the instant application, including the S99G, G102S, P131H, Q137H, Q245R, and N261D substitutions, as well as cleaning compositions comprising the multiply-substituted variants as well as other enzymes, while (b) claims 17, 19-22, and 24-29 of the copending '424 application are drawn to subtilase variants, such as group I-S1 and I-S2 subtilase variants, the latter including subtilisin 309 variants, as well as to cleaning

compositions comprising the multiply-substituted variants as well as other enzymes, wherein the subtilase variants may comprise any of the substitutions sets:

- (1) **S9R+A15T+V68A+H72F+S99G+Q245R+N261D**,
- (2) **S9R+A15T+V68A+N76I+S99G+Q245R+N261D**,
- (3) **S9R+A15T+V68A+I79T+G102S+P131H+Q137H**, or
- (4) **S9R+A15T+V68A+S99G+A228V+Q245R+N261D**;

and wherein each of the substitution sets may also comprise the substitution **N62D** according to the copending claim 24, as well as cleaning compositions of copending claims 28 and 29 that comprise the multiply-substituted variants, compositions that are otherwise indistinguishable from compositions comprising subtilase variants of claims 68 and 69 herein, and also because

- (c) von der Osten et al. '116 teach that the substitution **P(131)[129]H** made in either group I-S1 or group I-S2 subtilases confers resistance to autoproteolysis in Example 5 at col. 45,
- (d) Poulou et al. '628, teach that introducing the three amino acid the substitutions **V(68)[66]A**, **Q(245)[239]R**, and **N(261)[255]D** in either a group I-S1 or a group I-S2 subtilase improves the wash performance of the variant relative to the parent, or unmodified, subtilase in Table 2 at cols 11-12, and also teach that introducing **S(99)[97]G** and **Q(245)[239]R** amino acid substitutions in either a group I-S1 or a group I-S2 subtilase improves the wash performance of the variant relative to the parent, or unmodified, subtilase in Table 2 at cols. 15-16,
- (e) Ghosh et al. '450 teach that introducing any of the amino acid substitutions **V68A**, **A228V**, and **Q245R** in either a group I-S1 or a group I-S2 subtilase improves the wash performance of the variant relative to the parent, or unmodified, subtilase in Table II at cols 23-24,
- (f) Rubingh et al. '663 teach that introducing any of the amino acid substitutions **I(72)[70]F**, **I(79)[77]T**, or **N(76)[74]I** in either a group I-S1 or a group I-S2 subtilase decreases the immunogenicity of the variant relative to the parent, or unmodified, subtilase, e.g., at col. 4, lines 39-41 and 56-58, and col. 5, lines 1-4,
- (g) Brode et al. '733 [subtilisin 309] and Brode et al. '690 (subtilisin BPN') teach that introducing the substitution **G(102)[100]S** in either a group I-S1 or a group I-S2 subtilase improves the wash performance of the variant relative to the parent, or unmodified, subtilase at col. 9, lines 33-34, of the '730 patent and col. 5, lines 1-2 of the '690 patent, and further teach wherein detergent compositions further the incorporation of such subtilase variants in detergent compositions comprising a surfactant as well as other enzymes, including "cellulases, lipases, amylases and [other] proteases" in their abstract and at cols. 96-99, particularly col. 98, at lines 42-47, and

- (h) Roggen et al. '446 teach the preparation of a group I-S1 or a group I-S2 subtilase having reduced immunogenicity due to a substitution of histidine for the amino acid present at the subtilisin BPN'-correspondent position 137 in claim 78 at page 178, where SEQ ID NO:10 of Roggen et al. is the subtilisin BPN' amino acid sequence of SEQ ID NO:1 herein, also teach the substitution of histidine for the amino acid present at the subtilisin BPN'-correspondent position 137 in a subtilisin 309-like subtilase in claim 82 at page 178, and further teach the incorporation of such subtilase variants in cleaning and detergent compositions that may further comprise "proteases, amylases, lipolytic enzymes, cutinases, cellulases, peroxidases, [and] oxidases". See paragraphs 0237 and 0239-0242.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare either a group I-S1 or a group I-S2 subtilase that comprises the three amino acid substitutions **S9R**, **A15T**, and **V68A** required by claims 57-60¹ herein and that comprises as well the **S99G**, **Q245R**, and **N261D** substitutions disclosed herein, as required by claims 17, 19, 20, 22 and 24 of the copending '424 application. This is because the instant specification teaches that these are all advantageous modifications to make in preparing a variant group I-S1 or a group I-S2 subtilase, because Poulouse et al. '628, teach that it is advantageous to combine the amino acid substitution **68A** with the amino acid substitutions **Q245R** and **N261D**, and further teach that it is advantageous to combine a **68A** amino acid substitution with a **Q245R** amino acid substitution, in preparing a variant group I-S1 and I-S2 subtilase having improved wash performance relative to the parent, or unmodified, subtilase. It would also been obvious to such an artisan to further introduce any of the **I72F**, **I79T**, or **N76I** amino acid substitutions taught by Rubingh et al. '663 in a group I-S1, or in a group I-S2, subtilase having a set of **S9R**, **A15T**, **V68A**, **S99G**, **Q245R**, and **N261D** substitutions because Rubingh et al. '663 teach that any of these substitutions decreases the immunogenicity of the variant relative to the parent, or unmodified, subtilase, according to the limitations of claims 17-19, 29, 22 and 24-26 of the copending '424 application. It would have additionally been obvious to such an artisan to prepare cleaning or detergent compositions that comprise such multiply-substituted subtilase variants because Poulouse et al. '628, Rubingh et al. '663 and the instant application all teach incorporation of multiply-substituted subtilase variants cleaning or detergent compositions that comprise additional enzymes.

It would similarly have been obvious to one of ordinary skill in the art at the time the invention was made to prepare either a group I-S1 or a group I-S2 subtilase that comprises the

¹ Both claim 59 and claim 60 indicate a further substitution that is "V68A".

three amino acid substitutions **S9R**, **A15T**, and **V68A** required by claims 57-60 herein and that comprises as well the **G102S**, **P131H**, and **Q137H** substitutions disclosed herein as required by claims 17, 21, and 24-26 of the copending **'424** application because von der Osten et al. **'116** teach that introducing the **P131H** substitution in either group I-S1 or group I-S2 subtilases confers resistance to autolysis and Roggen et al. **'446** teach that a substitution of histidine for the amino acid present at the subtilisin BPN'-correspondent position 137 – which is a **Q137H** substitution in subtilisin 309 – can reduce the immunogenicity of the subtilisin, and also because both Brode et al. **'733** and **'690** teach that introducing the **G102S** substitution in either a group I-S1 or a group I-S2 subtilase improves the wash performance of the variant relative to the parent, or unmodified, subtilase. It would have additionally been obvious to such an artisan to prepare cleaning or detergent compositions that comprising such multiply-substituted subtilase variants because both Brode et al. **'733** and **'690**, von der Osten et al. **'116**, Roggen et al. **'446** and the instant application all teach incorporation of multiply-substituted subtilase variants cleaning or detergent compositions that comprise additional enzymes.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. § 103(c) and potential 35 U.S.C. §§ 102(e), (f) or (g) prior art under 35 U.S.C. § 103(a).

Claims 57-63 and 65-69 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Roggen et al. **US 2005/0181446** and any of Brode et al. **US 6,599,730**, **US 6,436,690**, **US 6,455,295**, or **US 6,475,765**, in view of Poulou et al. **US 6,482,628**, all of record.

Roggen et al. **'446** was cited and applied under 35 U.S.C. § 103(a) in the communication mailed 22 January 2009. Roggen et al. **'446** teach the preparation of group I-S1 and group I-S2

subtilases having one or more immunogenicity-modifying substitutions generically based on the numbering of the subtilisin BPN' amino acid sequence in the alignment of Table 1 that spans pages 39 through 43 of several subtilase amino acid sequences, including both subtilisins 309 and BPN'. A generic amino acid rendered only by position number in claims 78-88 of the **'446** publication is, for the purposes of this rejection, assigned the amino acid residing in the subtilisin 309 amino acid sequence at the subtilisin BPN'-correspondent position, thus Roggen et al. **'446** teach in their claims 78 and 82 the introduction of immunogenicity-modifying substitutions and deletions including **S(9)[9]R**, **A(15)[15]T**, **G(20)[20]***, **L(21)[21]F**, **T(22)[22]A**, **I(35)[35]V**, **P(52)[51]T**, and **V(139)[137]L**. Roggen et al. **'446** also teach that a resulting group I-S1 or group I-S2 subtilase variant may advantageously be incorporated in detergent compositions that may further comprise other enzymes, including "proteases, amylases, lipolytic enzymes, cutinases, cellulases, peroxidases, [and] oxidases". See paragraphs 0237 and 0239-0242.

Each of the patents to Brode et al. was cited and applied under 35 U.S.C. § 103(a) in the communication mailed 22 January 2009. The teachings of Brode et al. **'730** of modifications of the amino acid sequence of subtilisin 309 are exemplary of the set of patents to Brode et al. relied on herein. Brode et al. **'730** teach the preparation of variant subtilisins 309, a group I-S2 subtilase, comprising many different sets of multiple amino acid substitutions wherein the substitution **N(62)[61]D** is combined with further amino acid substitutions throughout a subtilisin amino acid sequence. See cols. 3, 5, 6, 7-10, and Tables 3-6 and 33-37 at cols. 16-18 and 67-96 of Brode et al., **'730**. Brode et al. **'730** also disclose that the multiply-substituted subtilisins 309 are advantageously formulated in detergent compositions to provide improved wash performance due to their "decreased absorption to, and increased hydrolysis of, an insoluble substrate" when used methods of cleaning textiles or surfaces, wherein detergent compositions further comprise a surfactant and other enzymes, including "cellulases, lipases, amylases and [other] proteases". See the abstract and cols. 96-99, particularly col. 98, at lines 42-47. Like Brode et al. **'730**, each of Brode et al. **'690**, **'295**, and **'765** teach the preparation of variant group I-S1 subtilases – respectively, subtilisin BPN', subtilisin Carlsberg, and subtilisin DY – that comprise the same substitutions that Brode et al. **'730** teach for the variant subtilisin 309, and likewise teach that any of the **N(62)[61]D** substitutions are advantageously combined with other amino acid substitutions in group I-S1 subtilases, which are advantageously formulated in detergent compositions to provide improved wash performance due to their "decreased absorption to, and increased hydrolysis of, an insoluble substrate" when used in methods of cleaning textiles or surfaces, wherein detergent compositions further comprise a surfactant and

other enzymes, including "cellulases, lipases, amylases and [other] proteases", to improve the wash performance of the variant, relative to the native subtilase, in a wash liquor.

Poulose et al. '628 teach the preparation of variant group I-S1 and group I-S2 subtilases that comprise multiple substitution sets that include, *inter alia*, the amino acid substitutions A(13)[13]V, V(68)[66]A, S(101)[99]G, S(103)[101]A, V(104)[102]I, G(159)[157]D, A(232)[226]V, Q(236)[230]H, Q(245)[239]R, N(248)[242]D, N(252)[246]K and S(259)[253]G in their Table 2 spanning cols. 9 through and 16 and particularly teach the nine-fold substitution set recited in claim 61 herein at the sixth line from the bottom of the portion of Table 2 spanning cols. 11 and 12. Poulose et al. '628 also teach that their multiply-substituted variants have improved wash performance relative to the parent, or unmodified, subtilase, and, like Roggen et al. '446 and each of Brode et al., '730, '690, '295, and '765, further teach the preparation of detergent compositions comprising their multiply-substituted subtilase variants.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare either a group I-S1 or group I-S2 variant subtilase according to claims 57-60 and 65-67 herein, and to incorporate such a variant subtilase in a cleaning or detergent composition that comprises further enzymes such as other proteases, amylases, lipases, cutinases, cellulases, peroxidases, and oxidases. This is because Roggen et al. '446 teach that preparing a generic subtilase variant that comprises the S(9)[9]R substitution can reduce the immunogenicity the subtilase, because each of Brode et al. '730, '690, '295, and '765 teach that introducing a N(62)[61]D substitution in either a group I-S1 of a group I-S2 subtilase improves the wash performance of both group I-S1 and group I-S2 subtilases and that it is combinable with further amino acid substitutions throughout a subtilase amino acid sequence, because Poulose et al. '628 teach the V(68)[66]A substitution is advantageously made in either a group I-S1 or group I-S2 subtilase and teach in their Table 2 that it is combinable with further amino acid substitutions throughout a subtilase amino acid sequence, and because each of Roggen et al., Brode et al., and Poulose et al. teach the advantages of each amino acid substitution in a protease formulated in detergent compositions sold to the public and that such compositions may comprise further enzymes, including other proteases, amylases, lipases, cutinases, cellulases, peroxidases, and oxidases.

It would also have been obvious to one of ordinary skill in the art at the time the invention was made to prepare either a group I-S1 or group I-S2 variant subtilase according to any of claims 61, 62, and 63 herein. Specifically, it would have been obvious to such an artisan to combine the pair of amino acid substitutions S(9)[9]R and N(62)[61]D of claim 57 with the nine-

fold set of S101G+S103A+V104I+G159D+A232V+Q236H+Q245R+N248D+N252K substitutions taught by Poulouse et al. '628 in their Table 2 to be advantageously made in either a group I-S1 or group I-S2 subtilase to prepare a subtilase variant of claim 61 herein. It would also have been obvious to such an artisan to combine the pair of amino acid substitutions S(9)[9]R and N(62)[61]D of claim 57 with one or more of the amino acid sequence modifications A(15)[15]T, G(20)[20]*, L(21)[21]F and P(52)[51]T, taught by Roggen et al. '446 to be advantageous in their claim 78 as well as with either or both of the Q(245)[239]R and S(259)[253]G amino acid substitutions that Poulouse et al. '628 teach may be advantageously combined with other amino acid substitutions made in either a group I-S1 or group I-S2 subtilase in their Table 2 in order to prepare a subtilase variant of the second, fourth, and fifth substitution sets set forth in claim 62 herein. It would similarly have been obvious to such an artisan to combine the pair of amino acid substitutions S(9)[9]R and N(62)[61]D of claim 57 with the further amino acid sequence modifications A(15)[15]T and T(22)[22]A that Roggen et al. teach are advantageously made in either a group I-S1 or group I-S2 subtilase in their claim 78 in order to prepare the first substitution set recited in claim 63 herein. This is because artisans in the crowded art of subtilase modification would have experienced adequate motivation to combine diverse prior art amino acid modifications with the expectation that each can confer the benefit(s) taught in the prior art and, based upon the teachings of the cited references, the level of skill of one of ordinary skill in the art, and absent any evidence to the contrary, there would have been a reasonable expectation of success in practicing the claimed invention.

The applied reference, Roggen et al., '446, has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 USC § 102(e). This rejection under 35 USC § 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 USC § 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 USC § 103(c) as prior art in a rejection under 35 USC § 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Art Unit: 1656

Claim 64 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Roggen et al. '446, and any of Brode et al. '730, '690, '295, or '765, and Poulouse et al. '628, as applied to claims 57-63 and 65-69, and further in view of Fano et al., US 6,727,085, of record, and Branner et al., US 5,482,849, Hansen et al., US 6,555,355, Ghosh et al., US 6,831,053, made of record herewith.

The teachings of Roggen et al. '446, each of Brode et al. '730, '690, '295, or '765, and of Poulouse et al. '628, discussed above, are taken as before. Ghosh et al. '053 teach that it is advantageous to introduce the amino acid substitution Q(245)[239]W in either a group I-S1 or group I-S2 subtilase in their Table II, at cols. 47-48. See the third line from the bottom of the array spanning both columns. Hansen et al., '353 teach that it is advantageous to prepare a multiply-substituted subtilase variant of either group I-S1 or group I-S2 that comprises any of the substitutions N(252)[246]V, N(252)[246]M, or N(252)[246]S at the subtilisin BPN'-correspondent position 252. See claim 2 for the N252S substitution and Tables II and V for the N252V and N252M substitutions. Branner et al. '849 teach that it is advantageous to prepare a variant group I-S1 or group I-S2 subtilase that comprises, among other amino acid substitutions, the amino acid substitution H(120)[118]N to improve its wash performance when formulated in cleaning or detergent compositions. See claim 5. Fano et al. '085 teach the preparation of a variant group I-S1 or group I-S2 subtilase that comprises, among other amino acid sequence modifications, the amino acid substitution P(131)[129]T in order to provide a variant with better resistance to protease inhibitors found in food stains when formulated in cleaning or detergent compositions. See the sets of amino acid sequence modifications listed in each of their Examples 1-3.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to prepare the group I-S1 or a group I-S2 variant subtilase recited in the first substitution set of claim 64 by combining the pair of amino acid substitutions S(9)[9]R and N(62)[61]D of claim 57 with the amino acid sequence modification A(15)[15]T taught by Roggen et al. '446 to be advantageous in their claim 78 and to further combine these substitutions with both the H(120)[118]N substitution that Branner et al. '849 teach is advantageous to improve the wash performance of a subtilase when formulated in cleaning or detergent compositions and the P(131)[129]T taught by Fano et al. to provide a variant with better resistance to protease inhibitors found in food stains when formulated in cleaning or detergent compositions. It would also have been obvious to one of ordinary skill in the art at the time the invention was made to prepare any of the group I-S1 or group I-S2 variant subtilases recited in the second, third, and fourth substitution sets of claim 64 by combining the pair of amino acid substitutions S(9)[9]R and N(62)[61]D of claim 57 with the amino acid sequence modification A(15)[15]T taught by

Roggen et al. '446 to be advantageous in their claim 78 and to then combine these three substitutions with either the Q(245)[239]R substitution that Poulouse et al. '628 teach in their Table 2 is be advantageously introduced in either a group I-S1 or group I-S2 subtilase or the Q(245)[239]W that Ghosh et al. '053 teach is advantageously introduced in either a group I-S1 or group I-S2 subtilase in their Table II, at cols. 47-48, as well as to combine one of the N(252)[246]V, N(252)[246]M, or N(252)[246]S substitutions that Hansen et al. '353 teach is advantageous to introduce in either a group I-S1 or group I-S2 subtilase in their Tables II and V and claim 5. This is because artisans in the crowded art of subtilase modification would have experienced adequate motivation to combine diverse prior art amino acid modifications with the expectation that each can confer the benefit(s) taught in the prior art and, based upon the teachings of the cited references, the level of skill of one of ordinary skill in the art, and absent any evidence to the contrary, there would have been a reasonable expectation of success in practicing the claimed invention.

The applied references, Roggen et al. '446 and Fano et al. '085, have a common assignee with the instant application. Based upon the earlier effective U.S. filing date of these references, they constitute prior art only under 35 USC § 102(e). This rejection under 35 USC § 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 USC § 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome, particularly with respect to the first substitution set recited in claim 64, by showing that either or both of the references are disqualified under 35 USC § 103(c) as prior art in a rejection under 35 USC § 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Conclusion

It is noted that the first and third sets of substitutions in claim 62 is free of the prior art of record which does not teach or suggest the substitutions Q245F or Q245N at the subtilisin BPN'-correspondent position 245 in a group I-S1, group I-S2, or other subtilase. Similarly, the second through fifth sets of substitutions in claim 63 are free of the prior art of record which

Art Unit: 1656

does not teach or suggest an insertion of glycine or leucine following a threonine at the subtilisin BPN'-correspondent position 22 in a group I-S1, group I-S2, or other subtilase.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William W. Moore whose telephone number is 571.272.0933 and whose FAX number is 571.273.0933. The examiner can normally be reached Monday through Friday between 9:00AM and 5:30PM EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisory Primary Examiner, Andrew Wang, can be reached at 571.272.0811. The official FAX number for all communications for the organization where this application or proceeding is assigned is 571.273.8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571.272.1600.

/William W. Moore/
Examiner, Art Unit 1656

/ANAND U DESAI/
Primary Examiner, Art Unit 1656
August 3, 2009